OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : Distribution

DATE: MAY 28 1969

(Davis/5724/69-148-87/2)

FROM : Apollo Program Manager, AP

SUBJECT: KSC Apollo Program Directive No. 2A, "Requirements for the Submission of Engineering Changes and Modifications to Configuration Control Boards"

1. As a result of the release of K-AM-031/5, "KSC Apollo/Saturn Configuration Control Board" dated May 5, 1969, the subject KSC Apollo Program Directive 2A is hereby cancelled.

2. The overall requirements and responsibilities for KSC Configuration Control Boards are contained in K-AM-031/5.

R. O. Middleton

R. O. Middleton
Rear Admiral, U. S. Navy

Distribution:

STDL "C"

5010-106

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

TS 90602-6

3-154

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : See Distribution DATE:

FROM : Apollo Program Manager, AP

SUBJECT: KSC Apollo Program Directive No. 2A, "Requirements for the Submission of Engineering Changes and Modifications to Configuration Control Boards".

The enclosed KSC Apollo Program Directive No. 2A cancels and supersedes KSC Apollo Program Directive No. 2, dated December 8, 1965. This document is effective immediately.

R. O. Middleton
Rear Admiral, U. S. Navy

Distribution: STDL D

5010-108

KSC APOLLO PROGRAM DIRECTIVE NO. 2A

TO: Distribution FROM: R. O. Middleton
KSC Apollo Program Manager

SUBJECT: REQUIREMENTS FOR THE SUBMISSION OF ENGINEERING CHANGES AND MODIFICATIONS TO CONFIGURATION CONTROL BOARDS

REFERENCES:

(1) Apollo Program Directive No. 28, Apollo Program Director Level I Change Approval Requirements, June 1, 1967.

(2) SE-005-001-1, Apollo Program Specification, June 27, 1967. Confidential.

(3) SE-010-000-1, Apollo Flight Mission Assignments, November 14, 1966. Confidential.

(4) M-D-MA-3400.033, Apollo Program Directive No. 18, May, 1966. (Changes to Apollo Hardware and Software for Saturn/Apollo Applications).

(5) M-D-MA-1400.005, Apollo Program Directive No. 4C: Apollo Program Schedule and Hardware Planning Guidelines and Requirements, June 30, 1967. Confidential.

(6) M-D-MA-1400.023, Apollo Program Directive No. 14, Change Control of Apollo Space Vehicles at KSC, January 6, 1967.

(7) NHB 8080.1, Apollo Test Requirements, March, 1967.

(8) NPC 400, NASA Procurement Regulations, June 15, 1967.

(9) K-AM-03, and Exhibits, KSC Apollo Configuration Management Manual, January, 1966.

(10) NMI (Proposed), Manned Space Flight Management Procedures for Assuring Readiness and Effectiveness of the Ground Operations Support System.

I PURPOSE

This directive establishes KSC Configuration Control Boards and provides the criteria for the submission of Class I Engineering Changes to Level III, Level II, and Level I CCB's.

II SCOPE

This directive establishes the KSC Level III and Level II CCB's and identifies respective chairmen and alternates (see Addendum No. 1). Requirements for submission of proposed changes to the Level III, Level II, and Level I CCB's (Apollo Program Directive 28), prior to completion of Flight Readiness Test (FRT) or Count Down Demonstration Test (CDDT), which ever occurs first, are incorporated in this directive. Procedures for submission and approval of proposed changes or modifications after FRR will be provided separately for each vehicle by this office.

III APPLICABILITY

KSC organizations involved in the implementation of the directive are:

Apollo Program Manager
Director of Launch Operations
Director of Design Engineering
Director of Technical Support
Director of Installation Support
Director of Administration

IV REQUIREMENTS

1. Criteria for Submission of Changes to the Level I CCB

Approval by the Apollo Program Director (Level I CCB) is required for all changes or program actions meeting the following criteria:

a. General Requirements

(1) Any change to Apollo hardware, software, or facilities which would result in the inability to meet the technical requirements or mission profile established in the Apollo Program Specification (Reference 2) or the Apollo Flight Mission Assignment Document (Reference 3).

(2) Any change to Apollo Program end items to meet the requirements of the Saturn/Apollo Applications Program (Reference 4).

b. KSC Changes

(1) Any changes to Apollo space vehicle hardware or software to be incorporated at KSC and affect the established launch date (Reference 5) or planned mission objectives (Reference 2 and 3).

(2) Any change to MSC or MSFC equipment which is to be incorporated at KSC and is estimated to require 500 man hours or more per effectivity to install.

(3) Space Vehicle, related GSE and facility items which are provided by KSC or MSFC which impact the Headquarter Apollo Program Schedule.

c. Schedule and/or Quantity Changes

Any change which affects any Apollo Controlled Milestones date (Levels A, B, C, and D) or controlled hardware quantity (Reference 5).

d. Costs

Any change for which the estimated dollar cost will require that the resulting contract document, contract modification or contract supplemental agreement be submitted for Headquarters' approval per NPC 400 (Reference 8).

e. Level "A" Interface

All inter-center changes which do not otherwise meet Level I criteria but cannot be resolved to the mutual satisfaction of centers concerned.

f. Other

Any change which results or may result in any of the following:

(1) Affects the predicted hardware or system performance against the established safety and reliability as set forth in: (a) Apollo Program Specification (Reference 2), and (b) NHB 8080.1 (Reference 7).

(2) Modifies the Apollo System after the Flight Readiness Review (FRR), Flight Readiness Test (FRT) or Countdown Demonstration Test, (CDDT), which ever occurs first.

(3) Any other change that the Apollo Program Director selects as requiring his approval.

g. Emergency Changes

In the case of emergency changes requiring Level I CCB approval, interim approval may be requested from the Apollo Program Director or his deputy by telephone or TWX with written action to follow in all cases.

h. Exclusions

Assignment of responsibility and establishment of procedures for assurance of the mission readiness and performance effectiveness of the several technical ground projects which support Manned Space Flight (MSF) missions is being accomplished by Reference 10. These excluded projects, constituting the Manned Space Flight Ground Operations Support System (GOSS) are: Launch Information Systems (LIS), Manned Space Flight Network (MSFN), and Mission Control System (MCS).

2. Level II CCB

a. Processing of Changes for Level I CCB Action

The Level II CCB shall evaluate all KSC Class I Engineering Changes which meet the criteria of paragraph IV.1 and shall forward the change package with recommendations to the Level I CCB (APOH) if approval is required. The Level II CCB can disapprove a change which meets the criteria of paragraph IV.1, but the change originator (KSC organization) may request that the change be forwarded to the Center Director for appeal.

b. Approval Authority

Level II CCB Chairmen are delegated authority to approve or disapprove Class I Engineering Changes to KSC designed GSE and facilities which meet the following criteria:

(1) Level "A" interface revisions (outside the scope of IV.1.e) with concurrent approval of other affected centers.

(2) Level "B" (KSC interdirectorate) interface.

(3) The estimated total cost to the Government for the design and implementation of the change will exceed ten thousand dollars ($10,000) provided that the resulting contract document, contract modification or contract supplemental agreement does not require APOH approval in accordance with NPC 400. Approval authority for "AO and Apollo R & D Minor Construction and Repairs and Alterations Projects" is limited to ten thousand dollars ($10,000) without APOH approval.

(4) Changes proposed by KSC operating Divisions that have not been satisfactorily resolved by Level III CCB's. The change originator may request that Level III actions not in consonance with the requirements of his Change Request be forwarded to Level II CCB for action.

(5) Changes to KSC Project Specifications.

e. Prior Coordination

Proposed changes to Equipment/Location to be accomplished on site must be coordinated with the appropriate operating directorate, prior to submission to the Level II CCB.

d. Processing

Level II CCB's shall observe the intent of the revised requirements of K-AM-03 (Reference 9) in the processing of changes.

3. Level III CCB's

a. Processing of changes for Level I and Level II CCB Approval

All Class I Engineering Changes to Apollo/Saturn GSE and facilities procured by KSC Design organization shall be submitted to the cognizant KSC Level III CCB for evaluation and disposition. (NOTE: The cognizant Engineering Manager or IN Division Chief will make the determination as to whether a change is a facility or equipment modification). The Level III CCB shall evaluate all engineering changes which meet one or more of the criteria of paragraphs IV.1 and IV.2 and shall forward the change packages, evaluations, and recommendations to the Level II CCB for disposition if Level II or Level I approval is required. The Level III CCB can reject engineering changes which meet the criteria of paragraphs IV.1 and IV.2: the change initiator (KSC organization) may request that the rejected change be forwarded to the Level II CCB for disposition.

b. Change Level Identification

Changes outside the scope of the Level III CCB shall be forwarded to the Level II CCB Secretariat. The CCBD (KSC Form 4-94) to the Level II CCB Secretariat shall clearly identify the level of action required on each change package by the insertion of one of the following phrases in the Comments Block: (a) Level I CCB action required, (b) possible Level I CCB action required or (c) Level II CCB action only.

c. Level II Change Coordination

Before submittal to the Level II CCB for action, all changes shall be fully staffed with impacted design and operational organizations. Comments and/or concurrences will be returned to the CCB Secretariat within 10 working days.

d. Approval Authority

Level III CCB Chairmen are delegated authority to approve/disapprove those engineering changes to GSE or facilities under their direct responsibility which comply with the following criteria:

(1) No Level "A" or Level "B" interface impact. Where Level "A" or "B" interface impact is involved, an interface technical agreement shall be completed by DE before submission of the change to the Level II CCB.

(2) The change does not affect any Apollo Controlled Milestone date (Level A, B, C, and D) or controlled hardware quantity (Reference 5).

(3) The estimated total cost to the Government for the design and implementation of the change will not exceed ten thousand dollars ($10,000).

(4) Sufficient funds are available. If additional funds are required, the approved CCBD accompanied by a Procurement Request, KSC Form 19-33, must be submitted to the Program Control Office (AP-PCO) for funding approval.

(5) The change will not modify the engineering scope or content of active Level II or Level I CCBD's.

e. Expedited Level I CCB Changes

When expedited action is required on a Level I Change (or possible Level I Change), the Level III CCB Chairman shall review, process and if approved, immediately forward the change to the Level II CCB Chairman who will coordinate the change with APOH (Level I).

f. Change Processing

Level III CCB's shall observe the intent of the revised requirements of K-AM-03 (Reference 11) in the processing of changes.

g. Distribution

Level III Configuration Control Board Directives (See Addendum No. 2).

4. Change Initiation Requirements

a. Requests for Changes

All requests for changes to KSC designed equipment will be considered valid only if signed by one of the designees as shown on Addendum No. 1 to this directive. The CR as approved by these designees will recommend a priority. (Reference paragraphs V, 2, 3, and 4). All requests not reflecting an approved signature will be returned to the originator for validation. The originator will forward the Change Request to the cognizant Engineering Manager or IN Division Chief for his review and coordination.

b. Approval of Change Requests

For Mandatory Changes to facilities and GSE, the cognizant Engineering Manager or IN Division Chief will assess the CR and prepare and sign a Level III CCBD. The CCBD and the Change Request will then be forwarded to the Area Manager for his review and approval and release. The Area Manager's signature approval and priority assignment is considered official on Mandatory Changes and constitutes center direction while Level II CCB validation action is pending. On Highly Desirable and Desirable Changes, see Addendum No. 3, Apollo Saturn Change Flow. Those CR's recommended for disapproval will be dispositioned thru normal Level III CCB action.

c. Change Request Classification

The Area Manager will assure that all CCBD's issued will reflect one of the priorities indicated below:

	Priority	Authorizes
(1)	Mandatory	Design, Procurement and Installation
(2)	Highly Desirable	Design, Procurement may be approved
(3)	Desirable	ECP Preparation

d. Change Processing

All request for changes to KSC designed equipment will be processed in accordance with Addendum No. 3. (Apollo Saturn Change Flow)

V DEFINITIONS

1. Class I Engineering Changes

The definition of Class I Engineering Changes is the same as that contained in K-AM-031/3, Section 1.5, and is provided here for ease of reference.

All proposed engineering changes in accepted and unaccepted complete end items, assemblies, or items to the lowest level of assembly provisioned shall be designated as Class I changes in design whenever one or more of the following is affected.

1. Contract specification, contract price or fee, contract weight, contract guarantees, contract delivery or contract test schedules (including the total specification tree and documents referenced in the contract specification).

2. Contract reliability and/or contract maintainability.

3. Performance as stated either in definite terms or goals; or as experienced in items in service use.

4. Interchangeability, or a change in category regarding substitutability or replaceability.

5. Safety.

6. Electrical interference to communications - electronic equipment or electromagnetic radiation hazards.

7. Changes to Ground Support Equipment (GSE) or Facilities which have an effect on other Launch Vehicle Equipment Facilities, Class I or II Training Equipment, or Government Furnished Equipment (GFE).

8. Preset adjustments or preset schedules to the extent that (1) new identification must be assigned, or (2) operation limits are affected.

9. Systems, Equipments, or Facilities procured by agencies to the extent that other agencies must accomplish and engineering change to maintain compatibility at the interface.

10. Operational computer programs (See 3.3.21).

11. A change of qualified vendors, i.e., a different or new source, applicable at the removal - reparable level or higher assemblies.

2. Mandatory Change-Category I
An Engineering change required to effect any one of the following:

Definition	Actions to Implement
a. Eliminate an unacceptable condition which could cause a loss of life, stage, or space vehicle.	Any action whatsoever, including delay to launch date.
b. Meet primary mission objectives.	
c. Eliminate an unacceptable priority I or S single failure point potential or UCR.	
d. Make a system operable to support a launch.	

3. Highly Desirable Change-Category II

An Engineering Change required to effect any one of the following:

Definition	Actions to Implement
a. Meet secondary mission objectives.	Any action short of launch delay; including use of premium time, premium transportation, rearrangement of internal KSC schedules.
b. Eliminate an unacceptable priority II single failure point risk, or UCR's.	
c. Lend a high degree of improvement in successful launch or checkout operations.	
d. Eliminate excessive resources expenditures.	
e. Significantly reduce refurbishment costs and schedules.	
f. Eliminate a potential hazard which would result in serious injury or damage to flight hardware.	

4. Desirable Change-Category III	Actions to Implement
All other required changes.	Routine, non-interference, no overtime.

VI ADDENDA

1. Level II and Level III CCB Chairmen, Principals and Alternates.
2. Distribution - Level III Configuration Control Board Directives.
3. Apollo Saturn Change Flow.

ADDENDUM NO. 1: LEVEL II AND LEVEL III CCB CHAIRMEN

1. Level II CCB Chairman

The Level II CCB Chairman is:

R. Admiral Middleton	AP, Principal
E. R. Mathews	AP, Alternate
J. C. Wootton	AP-SYS, Alternate
T. F. Goldcamp	AP-SYS-2, Alternate

2. Level III CCB Chairmen

The Level III CCB Chairmen are:

a. LC-39 Area

D. D. Buchanan	DE-KEM, Principal
L. S. Harris	DE-KEM-2, Alternate

b. LC-34/37 Area

C. T. Wasileski	DE-CEM, Principal
T. E. Utsman	DE-CEM-2, Alternate

c. S/C Industrial Area

R. P. Dodd	DE-FAC, Principal
A. G. Porcher	DE-FAC, Alternate

d. Information Systems

R. L. Wilkinson	IN-MSD, Principal
T. Michalek	IN-MSD-1, Alternate

3. Delegation of Authority

The full authority of the Chairman or Principal shall be delegated to any of the above designees when presiding at CCB meetings.

4. Change Request Initiation Approval

The originating signature authority for CR's is delegated only to the following:

AP - J. C. Wootton	IN - P. A. Minderman
DE-CEM - C. T. Wasileski	IS - R. C. Daley
DE-EEM - W. E. Parsons	LS - J. H. Leet
DE-FAC - R. P. Dodd	LV - L. E. Hill
DE-KEM - D. D. Buchanan	SF - F. X. Hartman
	SO - D. O. Black

ADDENDUM NO. 2: DISTRIBUTION LEVEL III CONFIGURATION CONTROL BOARD DIRECTIVES

Information copies of all Level III CCBD's shall include as a minimum AP-OPN, and AD-RMO-4 with additional distribution as follows:

1. Those affecting the Spacecraft Industrial Area, AP-SCO.

2. Those affecting LC-34/37/39, AP-LVO.

ADDENDUM NO. 3: APOLLO SATURN CHANGE FLOW

1. CR Originator

The CR originator will complete KSC Form 14-100 per K-AM-031/8 and forward the document to the cognizant personnel (Addendum No. 1, para. 4) for approval signature. The designee will review the CR, recommend a priority and forward the document to the cognizant Engineering Manager or responsible IN Division Chief.

2. Engineering Manager

The Engineering Manager or IN Division Chief will review, coordinate and process the CR in accordance with internal directorate procedures. For Mandatory and Highly Desirable Changes, the Engineering Manager or IN Division Chief will then prepare and sign a Level III CCBD, which will be forwarded along with the CR to the Area Manager. When processing Desirable changes, the Engineering Manager or IN Division Chief will sign and transmit the CR to the responsible Area Manager for review and approval.

3. Area Manager

3.1 Mandatory and Highly Desirable Changes

The Area Manager will review, approve/disapprove, sign and release the CCBD for immediate implementation of the authorized activity.

3.2 Desirable Changes

The Area Manager will review, sign and release the CR for further processing.

The Area Manager's approval signature and priority assignment will be considered official and constitutes center direction while Level II CCB action is pending.

4. Processing Mandatory Changes

After the Area Manager signs the CCBD, it is forwarded to the Level II CCB for concurrence and validation. Concurrently, the signed CCBD is transmitted to the Engineering Manager or IN Division Chief authorizing him to assure that design, procurement and installation are accomplished.

4.1 Engineering Manager or IN Division Chief

The Engineering Manager or IN Division Chief will direct the cognizant contractor(s) to proceed with design, procurement and installation. The Engineering Manager or IN Division Chief will also assure that a record ECP, with a complete change package, is generated and forwarded to the responsible CCB within 10 working days of CCBD approval by the Area Manager.

4.2 ECP Processing

A copy of the record ECP will be immediately forwarded to the responsible CCB within 10 working days after CCBD approval by the Area Manager. The ECP will not be approved by the CCB and will only be used to assure that time, cost and engineering do not cause a Level I impact.

5. Processing Highly Desirable Changes

If the CCBD, as signed by the Area Manager, authorizes procurement, the CCBD will be transmitted to the Level II CCB for concurrence and validation. Those CCBD's authorizing only design will be signed and returned to the Engineering Manager or IN Division Chief who will assure that the necessary design is initiated.

5.1 Engineering Manager

The Engineering Manager or IN Division Chief will direct the cognizant contractor(s) to proceed with design and develop an ECP with a complete change package. If the CCBD received from the Area Manager also authorizes procurement, the Engineering Manager or IN Division Chief will also direct the contractor(s) to proceed with procurement.

5.2 ECP Processing

The ECP is then processed through the CCB's in accordance with internal directorate procedures. The CCB will issue a revised CCBD reflecting the dispositioning of the change.

6. Processing Desirable Changes

After the Area Manager signs the CR, it is forwarded to the Engineering Manager. The Engineering Manager will assure that the ECP, with a complete change package is developed and processed through the CCB(s) in accordance with internal directorate procedures.

In the event the requirements of this directive conflict with subordinate directives, procedures and/or manuals the provisions set forth herein shall govern.

JOHN F. KENNEDY SPACE CENTER
CONFIGURATION CONTROL BOARD DIRECTIVE

Page ____ of ____

(1) ☐ GSE ☐ FACILITY ☐ TRAINING

(2) BD NUMBER

(3) CONTRACTOR

(4) ECP NUMBER | (4A) DATE

(5) SUPERSEDES ECP NO. | (5A) DATE

(6) END ITEM NUMBER

(7) END ITEM PART NUMBER

(8) MI NUMBER & TYPE

(9) PART NUMBER CHANGE ☐ YES ☐ NO

(10) SPARES AFFECTED ☐ YES ☐ NO

(11) INTERFACE REQUIREMENTS

(12) DESIGN DEFICIENCY ☐ YES ☐ NO

(14) SPECIFICATION NUMBER

(15) ECP TITLE

(16) DATE (Day, Month, Year)

(17) SUPERSEDES ISSUE OF (Day, Month, Year)

(18) SPECIAL PROCUREMENT INSTRUCTIONS REQUIRED ☐ YES ☐ NO

(19) NOMENCLATURE, CONTRACT END ITEM

(20) TYPE LEGEND: P - PROD S - RETROFIT I - INSTALLATION & CHECKOUT

(21) EFFECTIVITIES:

(22) REMARKS:

ENDORSEMENT RECORD

ORGANIZATION	CONCUR YES	CONCUR NO
DESIGN		
LAUNCH OPERATIONS		
INSTRUMENTATION		
ACTIVATION BOARD		
RELIABILITY & QA		
FACILITIES		
CONTRACTS		
P & C		
FUNDING		
INTERFACE PNL.		
OTHER		

(23) Engineering Manager (Signature)
APPROVE
DISAPPROVE

(24) Date

(25) Chairman Level III CCB (Signature)
Approve
Disapprove
Change Classification to _____

(26) Date

(27) Chairman Level II CCB (Signature)
Approval/Concurrence
Disapprove
Change Classification _____

(28) Date